

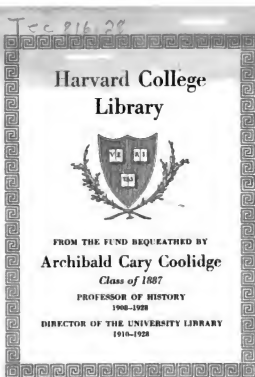
WIDENER



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SOME CONSIDERATIONS
ON THE SUBJECT OF PUBLIC
CLOCKS

Tec 816.28



Park Hall
May 20 1830

Sir.

The very flattering manner in which
you expressed yourself in regard to the
Sept. 5th of my Paper on Public Flocks &
of the Letter in which it is written; induces
me to hope you will not take notice of
the liberty I take in requesting the favour
of your acceptance of the accompanying
copy of the original Paper & its Sept.

The first copies of the Sept. were very
incorrectly printed, but the errors have
been subsequently corrected.

I am Sir,

Yours very much obliged humble
servant

Wm. Halliwell Esq. London

W. Halliwell

// **SOME CONSIDERATIONS**

ON THE SUBJECT OF

Public Clocks, //

PARTICULARLY

CHURCH CLOCKS:

WITH

HINTS FOR THEIR IMPROVEMENT.

DEDICATED, BY PERMISSION,

TO

THE RIGHT HONOURABLE AND RIGHT REVEREND

THE LORD BISHOP OF LONDON,

ONE OF THE COMMISSIONERS FOR BUILDING THE NEW CHURCHES,

&c. &c. &c.

By B. L. VULLIAMY,

CLOCK-MAKER TO THE KING.

LONDON:

PRINTED BY B. MCMILLAN, BOW-STREET, COVENT-GARDEN,

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1828.

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Tec 816.28



in the year 1943

SOME CONSIDERATIONS

ON THE SUBJECT OF

PUBLIC CLOCKS.

THE following observations on the subject of Public Clocks (particularly Church Clocks), are founded on the presumption that these machines are important objects of public utility. This supposition will not appear too hastily formed, upon consideration of the inconvenience which would result in the mutual intercourse of life, particularly in reference to Public Meetings, the Service of the Church, and commercial transactions, were there not other standards for the measure of time, besides the watches of individuals; since it may be easily inferred, from considering the expense of a good watch (independent of any external cost), that although few persons are to be found in the present day unprovided with a watch of some description, yet a very small proportion of the total number of watches in use, measure time with any degree of accuracy. The standards to which we must refer, therefore, are the Public Clocks, of which by far the greater number are Church Clocks. To inquire how far these, as at present constructed, are calculated to answer their immediate object, is my present purpose.

It is an observation which has often been made by those who have paid attention to the subject, that if a Watch, keeping time correctly, were to be set by a Public Clock, take, for example, that of St. Paul's Cathedral, and

the same day to be compared with a number of others of the same description, it would be found that scarcely two of them agreed together; some would be faster, others slower, and the extreme difference consequently considerable; it therefore follows, that the greater number of these Clocks must be wrong. I select that of St. Paul's as a standard, not on account of the accuracy with which it measures time, but from its local situation.

The indifferent performance of Public Clocks in general, commonly proceeds from one of the two following causes, and not unfrequently from both combined: *1st*, The inherent defects, in principle and execution, in the Clocks themselves;—*2nd*, The injudicious manner of fixing them in their places, or, as it is commonly termed, putting up, and arranging the work communicating from the Clock to the hands; for, so far as my observation extends (and I have examined a great number of large Clocks), the Church Clocks of the present day are in no one respect better made than they were fifty years ago, but the contrary; for, in some particulars, the new Clocks are inferior, especially in the quantity of material employed, which, to save expense, is often very improperly reduced, and the work crowded into too small a compass.

From what has been said, this question naturally suggests itself: Whence does it arise, that in a country so justly famous for the excellence of its machinery, the art of making large Clocks has not kept pace with the very rapid progress which has been made in the construction and execution of every other species of machinery? Whatever may be the cause, the fact is incontrovertible; and at the present time there is no branch of the mechanical arts in this country, with which I am acquainted, in so low and degraded a state. In justice to the makers of these Clocks, it is very proper to add, that the price allowed for the greater part of them, is an effectual bar to good workmanship; and this is one cause why they are so ill executed. Another arises from the mode in which these Clocks are ordered, and contracted for. When a Clock is required for a Church, the work is usually put up to public competition. The Parish Officers apply for tenders, and the Clock-maker who gives in the lowest estimate (supposing no favour to be shewn), is employed. This would be quite to the purpose, if

the parties making the tender were furnished with a detailed specification of particulars, as is usually done in every other species of contract-work. The estimates would in such case be made for the same machine; but in the case of the Clock, each of the parties offering to do the work, makes his own specification, and estimates upon it; consequently there are as many specifications as estimates. It must therefore be evident, that nothing can be more unfair towards the Clock-maker, or more deceptive to his employer, than this mode of proceeding. It is absurd to expect any security from estimates so formed, or that the work will be well done, when contracted for in this manner. Aware that the lowest tender will be accepted, the great object with each of the parties tendering, is to succeed in the competition; and, as the workmanship must necessarily be in conformity to the price, it is obvious that the result of this mode of obtaining Clocks, must be the production of machines of very inferior performance; by which the real object (a good Clock) is not attained, and a continual expense for repairs is incurred, which ultimately exceeds the cost of a perfect instrument.

The following is a copy of a specification sent to a Government Office for a Turret Clock, in 1825:

"A Turret Clock, of the best-finished hard-polished pinions and arbours, "best brass-work; and every part of the best materials, with a copper dial "of the size of three feet.

"A Bell to be attached, to be heard from one quarter to half a mile.

"A Ditto with a four-feet dial, and a bell to be heard from one and a half mile to two miles.

"A Ditto with a five-feet dial, and a bell to be heard from two and a half miles to four miles.

"What would the like description of Clocks be made for, if not required "to strike the hour?"

Here then is a specification and estimate all in one, in which the word "best" occurs many times, but means nothing, and affords no security whatever for the work being properly performed, either in principle or execution. "Hard-polished pinions" may be either made of steel, or of iron, case-hardened; to polish the arbours is of no use whatever, as far as relates either

to the durability or the performance of the machine. "Best brass-work," as here expressed, has no meaning; and as to "best materials," no Clock-maker of integrity ought to employ any other but the best. It is further to be observed, as particularly deserving of notice, that all mention of the diameter of the great wheels, the number of teeth of the wheels and pinions, the mode of constructing the pivot-holes, the escapement, the length of the pendulum, and the method of suspending it, the material of which the pendulum rod is made, and the weight of the pendulum bob, the length of its arc of vibration, the construction of the striking-work, the mode of communicating the motion from the Clock to the hands, and various other particulars, on which the durability of the machine, and the accuracy of its performance, *entirely* depend, are altogether avoided; neither is any intimation given of the size of the different Clocks, in proportion to the size of the bells upon which they are to strike; and the estimate for the Clock is mixed up with the estimate for the dial;—two things which it will be seen hereafter, have nothing to do with each other, and ought to be kept perfectly distinct.

The following is another specification and estimate for a Turret Clock sent to a Government Office in 1820:

"Turret Clock to go eight days, to strike on a bell three quarters to
 " one and a quarter hundred weight, wheels all brass, in a stout iron frame,
 " with brass bosses for the pinions to run in, stout copper dial-plate three
 " feet diameter, raised convex copper hands ribbed and gilt, all complete
 " and ready for fixing, for!"

The same remarks, with little variation, apply to this specification. The description of the hands is certainly ample; though, had it been mentioned that the counter-weights for the hands were to be placed out of sight, behind the dial, in the place of being applied as tails to the hands, as is too often done, whereby much confusion, in seeing the hour, is occasioned—it would have been more to the purpose.

Upon the same principle, in a specification and estimate for a Turret Clock, I have seen enumerated, among other useless details, the lacquering of the brass-work. Now, whether the brass-work is lacquered or not, is of

no moment; and if it is, the prime cost of the Clock is thereby increased but very few shillings.

The three principal considerations in making a Church Clock are as follows: *1st*, The durability of the work;—*2nd*, The accuracy of its performance;—and, *3rd*, That the Clock should be as little liable to be deranged or affected by external causes as possible. These ends can only be obtained by making use of proper materials, by constructing the machine on mathematical principles, and by executing the work with great accuracy and precision. Upon this subject I may further add, that in principle, the construction of these Clocks cannot be too simple; whereas the direct reverse is the usual practice. In public buildings of every description, durability is universally acknowledged to be a principal object; and the permanency of such an important appendage as the Clock, is surely a matter of considerable importance.

As a proof of the little regard that has been paid to mathematical principles in the construction of large Clocks, it will be sufficient to mention, out of a long list that might be enumerated, the two following extraordinary instances of erroneous construction: *First*, Fans* offering a considerable resistance to the air, are applied to the pendulums of the great Clocks at St. Paul's Cathedral and at Purfleet Magazine. It is to be presumed, that the intention of this contrivance has been to diminish the arc of vibration of the pendulum by opposing a medium (the atmosphere), the density of which is incessantly varying: a more unmathematical contrivance was certainly never devised or adopted. The same was the case with the Horse-Guards Clock until 1816, when I repaired it, and made the whole of the going part of the Clock new. This pendulum, with its fans, is still to be seen in the Clock-room.—*Second*, That the recoil of the escapement of the Clock at Bishopsgate Church (which is a very modern Clock, and at different times cost the Parish a very large sum of money) is so great as to be perceptible

* Since the above was written, I have seen the Clock at the Custom-House, London. There are also fans attached to the pendulum of this Clock. By the date on the Clock, it appears to have been made so recently as A. D. 1816; it was made by the same maker as the other.

as far back in the train as the second wheel, thereby causing an immense and unnecessary increase of friction; and the teeth of the wheels of the going part, on which there is very little strain, are stronger than those of the striking part, on which the strain is very considerable. Generally speaking, the practical part, or execution of the work, of these Clocks, is about on a par with the theory of their construction*.

Formerly the greater number of Church Clocks were what is termed thirty-hour Clocks, and required to be wound every day; and it has been observed, that as an opportunity occurs of setting the Clocks when they are wound, they cannot be much wrong in the course of twenty-four hours: but this implies two things, which, in the country particularly, occur but in few instances—namely, that the person who has the care of the Clock, is possessed of a good regulator, as a standard of comparison, and that he also is possessed of a very good watch, to convey the time from his regulator to the Church Clock. In the absence of such a requisite, the most obvious mode of reference is to a Sun-dial; but this is a very uncertain mode of comparison, especially in the winter; and besides, to be of real use, it is necessary the dial should be made and fixed with great accuracy: the observations also should be taken with very great attention, and the observer be familiar with the use of the Equation Table.

Of late years, to save the time and trouble of daily winding, these Clocks are made to go a week: the immediate consequence of this construction is, that at the end of the seventh day, the error of the Clock is frequently greater than it would have been in the case of the thirty-hour Clock, which renders it the more necessary the Clock should measure time with accuracy; but this evil is more than counterbalanced by the convenience; and it is perfectly practicable to make an eight-day Church Clock, even with four faces, measure time so accurately as to require to be set very rarely, notwithstanding the effect of the wind upon the hands externally; and even that inconvenience may be obviated, by making use of a pendulum with a sufficiently heavy

* The Clock at St. Paul's can be seen every day, Sundays excepted. Bishopsgate Church Clock was as I have described, when I examined it in August 1823; and I am not aware that it has been altered since.

bob*; but as this construction, if carried to any very great extent, would be attended with considerable additional expense, it is seldom worth while to employ it; the trifling variation arising from the above-mentioned cause, having been found, by experience, to compensate itself (always supposing the Clock to be properly made), taking one day with another. To facilitate the regulation of the Clock, and to ascertain exactly its rate of going after it is regulated, I have for several years past applied internally a seconds-hand to Turret Clocks, which I am not aware had been done before.

Another very material consideration in all Public Clocks, but more particularly Church Clocks, which frequently shew the time on four faces, is the dial, or, as it is sometimes called, the *face* of the Clock. The dials most commonly used, are made of copper: these are objectionable on the score of expense as well as appearance; for if large, and hammered out of a single piece of copper of sufficient strength, without being made very convex, they are exceedingly expensive.

The section of a copper dial is necessarily a spherical projection, as no flat surface of copper, of the dimensions of an ordinary clock face, would retain its figure under exposure to the sun. The consequence is, that the sun takes more effect upon the upper than on the lower half of the dial; and copper being, like all other metals, a good conductor of heat and no absorbent, the paint soon perishes by the joint influence of the sun and rain, especially on the upper half. The dial of the Clock at the Ordnance Dépôt in Tooley-street, is a very good illustration of these remarks, which apply to the best of copper dials; but in nine cases out of ten, these inconveniences are exceedingly aggravated by a most disproportionate increase of the convexity of the dial—an expedient commonly resorted to, in order to obtain a certain degree of strength with an inadequate quantity of material.

The description of face I recommend is of stone, forming part of the building, as is the case with the Clock-dials at the Horse-Guards; and at my recommendation, the faces of the Clocks at the new Church, Chelsea,

* I have applied a pendulum to a Clock, the bob of which weighs 448 pounds, which I believe is the heaviest ever put to a Clock. This Clock will be put up at the New Post-Office.

and the Royal Mews, Pimlico, have been built on this plan: the four faces of the Clock at Norwood new Church, have also been completed in the same manner: stone being an absorbent, and not so good a conductor of heat as metal, the paint adheres better, and lasts longer, and does not require to be renewed so often as on the copper dial. Another advantage of the stone dial is, that the centre can be sunk, and the hour-hand made to traverse in the sinking: this enables the minute-hand to lie close to the figures, and then almost all error from the effect of parallax is avoided, which in the copper dials is very considerable, especially when the minute-hand points at or near 15 and 45 minutes, and the hands are both above the dial. In the stone dials of Chelsea new Church, and the Royal Mews, Pimlico, the figures are cut in the stone, and sunk about the eighth of an inch, after the manner of the Egyptian monuments, from which I derived the idea. By this method, supposing the dial accurately divided, and the figures well shaped in the first instance, they will always remain so.

In conclusion, I feel gratified in being enabled to add, *1st*, That in the new Clock Tower at Windsor Castle, just completed, Mr. Wyattville has, at my suggestion, made the dial of stone, with the centre sunk, for the hour-hand to traverse in, and the figures sunk in the dial; and, *2nd*, That the Surveyor-General gives his unqualified approbation to this construction of dial for a Church or public building; and, by his permission, I have left a model of a dial on this plan at the Office of Works.

In the case of brick buildings, economy might be considered by making the dial of mastic, or Roman cement, and the centre and figures sunk as described. This sort of Clock-dial would cost very little, and be very durable.

In the old Churches, which are principally to be met with in the country, the Clock-dials that remain unaltered are flat, and generally made of wood, and not unfrequently covered with lead; but, from the perishable nature of the material in the one case, and the very bad adhesion of the paint to the lead in the other, this description of dial is now almost wholly out of use.

The facility with which the time is seen in a large Clock, depends upon the hands as well as the dial. As a general rule, the face of the hour-hand

should be in the same plane as the band on which the figures are sunk—(I am here speaking of a stone dial, made as above described)—and the minute-hand, if the work is well executed, may be laid one quarter of an inch, or at most three-eighths of an inch, above the surface of the figures. It is very common to put a large heart at the end of each of the hands, probably with the intention of rendering them more visible. This, as far as relates to the hour-hand, is not attended with any practical inconvenience; but the minute-hand should terminate in a blunt point. It is also essential, as has been before noticed, that the hands should be very correctly balanced; and the counter-weights situated behind the dial out of sight. I believe I may venture to say, that the hands of the Clock at the Horse-Guards are quite as distinct as those of any Clock in the metropolis.

The old Public Clocks were made not to shew the minutes, and consequently had only one hand; which hand indicated the hour and its subdivisions on the same circle. The Clocks at Westminster-Abbey, St. Margaret's Church, St. James's Palace, and many others, are on this plan; and when the power of the Clock is insufficient to carry two hands, this mode of shewing the time, inconvenient as it is, is preferable to encumbering the machinery, and always less confused than two hands made with tails for counter-weights.

These details may perhaps be thought tedious, and probably be considered by the generality of readers as too obvious to need insisting upon: my only reply to which is, I should have thought so too, had I not found them so universally neglected. I endeavoured to call the attention of the Commissioners for Building the New Churches, to the subject of Church Clocks, as long ago as the year 1823, but without success; having been replied to by a communication through Mr. Mawley, "that the Commissioners did not interfere with the Clocks for the Churches, which were provided by the respective parishes."—That neither the Commissioners, nor any other Public Authorities, do interfere, is to be very much regretted, since a most favourable opportunity seems to be passing away, of procuring the construction of at least a limited number of Public Clocks upon much better principles than have hitherto been employed; and the consequence, as I have in the

foregoing pages endeavoured to point out, is, that the art of making large Clocks is every day retrograding, and exhibits the singular instance of a branch of mechanical science, and one of very great importance, in which we are infinitely surpassed by the French, among whom the art of Turret Clock-making is patronized by the Government, as an object worthy of public attention, and thereby carried to an unrivalled degree of perfection. The large Clocks in France are fully deserving of the high reputation they have acquired throughout Europe. These observations will apply generally to the Public Clocks in Paris. I have bestowed very great care and attention in examining several of them, and I do not hesitate to assert, that they are executed, both in theory and practice, with the care and accuracy to which ours, unfortunately, can make no pretensions. This is the more to be regretted, because it appears by the testimony of the French Authors, whose works on the subject of Horology are pretty numerous, that at the beginning of the last century the very reverse was the case*.

This general excellence of the Turret Clocks at Paris, is undoubtedly to be attributed to the encouragement publicly afforded, by setting up such Clocks as those of the Hotel de Ville, and the Invalids†. But although it is

* Les Echappemens à repos comparés aux Echappemens à recul avec, &c. Par Jean Jodin. Paris, 1766.

† I went to Paris in 1825, on purpose to see the Clocks in that capital, particularly that of the Hotel de Ville. This Clock, which has the highest reputation of any Clock at Paris, was made in 1781 by Le Pante, the Uncle of the present Clock-maker to the King of France, of that name; and cost the City of Paris, including the bells, dial, and fixing in its place, 90,000 francs (3600*l.* sterling). This Clock is placed in a very commodious room, purposely fitted up to contain it, where it is kept with great care, and very clean, (which it may be as well thus briefly to notice, are points not sufficiently attended to in this country): all the appurtenances of this Clock are in accordance with it, and, altogether, this is probably the most complete Public Clock at present in use in Europe.

The Clock next in repute is that at the Invalids, made in 1782, which, though much smaller than the former, is, notwithstanding, a very splendid specimen of horological science and execution, and, without bells or dial, or appendages of any sort (but merely the body of the Clock) cost 24,000 francs (990*l.* sterling). The very correct performance of this Clock gave so much satisfaction to the Governor of the Establishment, Le Comte de Guibert, that in 1784 he caused it to be removed from its original situation to that which it

not to be expected that every Clock is to be formed with the same *luxu d'execution*, yet it is not to be denied, that such examples and such encou-

now occupies in the great gallery, where it is placed in a room fitted up on purpose to receive it, and is seen by the Public through a very large plate of glass.

The Clock at St. Cloud is very similar to that of the Invalids, and has been made much more recently: it cost 23,000 francs (920*l.* sterling).

The Clock at the Ecole Militaire (which is an older Clock, having been made in 1778), the Clocks at the Prefecture de Police, and at the Savonnerie (now a royal manufactory of carpets), and many others that might be enumerated, are of the same description, varying only in size and other particulars. All the above-named Clocks were made by Le Paute, Uncle and Nephew.

There is also a Clock made by Robine, at the Jardin des Plantes, which has a considerable share of public estimation; though I do not consider its construction to be so good as that of the others. It cost 25,000 francs (1000*l.* sterling).

I went a second time to Paris last October, being desirous of seeing a very large Clock, made by Wagner, that had been exhibited at the Exposition de l'Industrie Française, and which differed in some respects from any of those I had seen in 1823. This is also a very beautiful specimen of the art; but being only a thirty-hour Clock, afforded facilities to the maker, that an eight-day Clock does not possess. It cost 24,000 francs (960*l.* sterling)—merely the body of the Clock without any appendages—and was purchased by the Government for the Church of St. Denis, near Paris.

The dials of the principal Clocks at Paris are made of white enamel, with the figures painted black, and composed of thirteen pieces. They are very visible, but extremely expensive: the three dials of the Hotel de Ville Clock, which are each 9 feet 6 inches in diameter, and were the first dials of this sort made, cost, including the expense of the furnace, 24,000 francs (960*l.* sterling). They might, however, have been better constructed, and the hands laid closer to the face than they are.

Until very recently, all the French Public Clocks of any repute, were made to shew solar time; which circumstance much increased the difficulty of construction. The original intention of this mode of shewing the time was, that it was considered a convenience to persons residing in the country, particularly the peasantry who attend the markets at Paris, and who were supposed to take their time from sun-dials. This mode of shewing the time, by which the Public Clocks coincided with the Private Clocks and Watches only on four days in the year, had been long felt as a great inconvenience; and on the 24th December, 1826, all the Public Clocks shewing solar time, were altered to shew mean time. Previously, however, to this being done, an inquiry was made of Mr. Taylor, of the Royal Observatory,

ragement are the true causes of the improvement of the art. I shall take the liberty, with reference to Church Clocks, still to advert to one or two points, upon which I beg to be understood as speaking with all possible deference to the judgment of those who must be supposed to be much better informed on the subject than I can pretend to be. But considering a Church Clock as intended for the convenience of the Public at large, the greater the extent to which it can be heard to strike, and to which the time shewn on the face is made visible, the more it tends to fulfil the end for which it is designed. At any rate, a Public Clock is expected to become a general convenience to those residing in the neighbourhood in which it is placed.

To effect the latter of these two points, the dials of several of the New Churches are, in my humble opinion, much too small; but I beg to be understood as making this remark merely in reference to their effect in shewing the time; and it is perhaps a curious coincidence, that the largest of them, as given in a printed list which has been circulated, and which I presume to be correct, is considerably smaller than the common run of Public Clock faces formerly executed;—as for example, St. James's, Piccadilly, of which the diameter is 10 feet; St. Martin's, 8 feet; Islington Church, 9 feet; the Horse-Guards, 7 feet 5 inches; and many others much on the same scale. On the other hand, the dial of the new Church in Wyndham-place is only 4 feet in diameter; the new Church on Kennington-common, 6 feet 1 inch diameter; Trinity Church, Newington, 6 feet 9 inches diameter; St. Peter's, Walworth, 4 feet diameter; Langham-place Church, Mary-le-bone, 4 feet 9 inches diameter; the new Church in Stafford-street, Mary-le-bone, 6 feet diameter; the new Church in Waterloo-road, Lambeth, 6 feet diameter; Greenwich new Church, 4 feet 2 inches diameter; Norwood

Greenwich, to know at what period the Public Clocks in London ceased to shew true time. Mr. Taylor applied to me on the subject; and having examined three of the oldest of the Palace Clocks, I came to the conclusion, judging from their construction, that they never had shewn any other but mean time; and I do not believe that any other time was ever shewn by the Public Clocks in this country.

Church, the dials of which are elevated between 50 and 60 feet from the ground, 6 feet 8 inches in diameter*.

The other material circumstance to which I beg leave to refer, as connected with the utility of the Clock, is the situation and mode of hanging the bell† (or bells, if the Clock strikes the quarters), upon which its being distinctly and extensively heard, greatly depends. In the case of a peal, the bells are kept as low in the tower as practicable, in order that the least motion possible may be communicated to the building from the ringing. It is the general custom where there is a peal, to make the Clock strike upon the same bells, although, as Clock bells, they are in the very worst situation for being heard. The Clock, on the contrary, should always have separate bells; and as the Clock bells may be fixed, and the mere blow of the hammers cannot produce any of the consequences to be apprehended from the *swinging* of the bells in the upper part of a tower, they ought to be elevated to the utmost. Yet, even when there are only the Clock bells to be considered, they are universally placed as low in the tower as if they were designed to swing; so universally, that I have not, among the New Churches, seen a single instance in which the Clock bells are placed to any advantage.

Having had occasion last year to make a Clock for one of the new

* On the Continent, particularly in Italy, the faces of the Public Clocks are generally of very considerable diameter. I will only mention the one in the Piazza di S. Marco at Venice, which is elevated 49 feet from the ground, and about 17 feet 7 inches diameter.

† In the case of Norwood Church, the bell the Clock strikes upon is hung no higher in the tower than the bottom of the luffer-boarding that fills up the opening; whereas, were the bell placed in the upper compartment, or little temple which terminates the tower, I think I am not hazarding too much, when I add, that it would be heard at twice the distance it is at present. In Norwood Church tower there are two bells, and they are both hung to ring. It appears to me, that had only one been reserved for ringing, and hung as the two now are, and the other appropriated solely to the Clock, and hung as above-mentioned, it would have been much better.

At the Royal Mews, Fimlico, the bells, from the construction of the building, are obliged to be hung under the Clock tower; from which circumstance, the sound of the bells is much confined. The diameter of the dials of this Clock is 6 feet 10 inches; and they do not appear at all too large for their situation, though only 48 feet 9 inches from the ground.

Churches in the vicinity of London, I endeavoured to combine durability, accuracy, and, in short, all the points of an excellent Clock, with a very moderate expenditure; for it must not be supposed for a moment, that to obtain a very durable and excellent Clock, it is necessary to expend a sum at all approaching the cost of the before-mentioned French Clocks, in which a considerable part of the expenditure is absorbed in refinements of execution, which, however desirable their attainment may be on other accounts, do not contribute to the durability of the machine, or to the correctness of its performance, as far as the exact measurement of time is concerned. How far I have succeeded, remains to be proved.

The mode by which I proposed to attain these ends, was by paying the utmost attention to the mathematical construction of the machine, which is extremely simple; sparing no labour in the execution of the work in any of the acting parts, and at the same time not bestowing any work, or incurring any expense, merely for ornament, or for any thing not conducing to the object in view. To insure greater durability, I made the wheels, and all those parts commonly made of yellow brass, of gun-metal, and the whole of the work extremely solid and strong; very much more so than has been the practice of late.

I am now come to the last and most important part of the subject, and that which is deserving of the most attention, because I apprehend that the evil I am about to point out, may in all cases (at least of new buildings) be easily avoided. I am not acquainted with a single instance of a large Clock being made for a Church, or public building, in which some difficulty has not arisen, and considerable expense been incurred, in consequence of the alterations required to make the tower fit for receiving the Clock, or extra work done to the Clock, in order to adapt it to the building; the expense being in some cases very considerable; which, when economy is so great an object, as it seems to be, in building the New Churches, had certainly better be avoided. If every thing connected with the Clock and bells were arranged in the first instance, of course no difficulty could possibly arise in putting the Clock in its place; but even in making the simple provision of a Clock-room in a Church-tower, it appears to me that, without going into any very great

detail, the Architect might consider two or three points which have in several instances been totally forgotten; such as placing the Clock-room floor at such a level with regard to the dials, that the communication with the hands may be made without employing much rod-work; that space may be afforded for the vibrations of a pendulum of proper length; and that no impediment may occur to the fall of the weights from the greatest height possible, and that facilities may be afforded for suspending them. These objects may generally be attained in the first instance, by a little attention in trimming the floors; and the neglect of them operates as a matter of expense in two ways: *First*, By cutting the tower to pieces to receive the Clock; and, *Secondly*, By creating a necessity for a great deal of rod-work, and other machinery, in accommodating the Clock to an inconvenient situation. In the Church Clock I have already mentioned, I experienced very considerable difficulty in arranging the fall of the weights, and much expense was incurred in making the Clock-room to answer its purpose; all of which might have been avoided, by attention to the subject previous to the erection of the tower.

I have now pointed out the principal considerations which have induced me to solicit attention to the state of the Public Clocks. It may perhaps be considered, that I have attributed too much importance to the subject; but I trust I shall have said enough to produce a conviction that it has hitherto been treated with neglect, and that it is not unworthy of attention and protection. I may further add, that Turret Clock-making is the parent of the art of Horology in all its branches; and when it is considered how intimately Horology is connected, by means of Marine Chronometers, with the maritime power and commerce of this country, I do not think I am in danger of over-rating its importance, or of exacting too much, in asking for its encouragement.

Finis.

A

SUPPLEMENT

TO THE PAPER ENTITLED,

"SOME CONSIDERATIONS ON PUBLIC CLOCKS, WITH HINTS FOR THEIR
IMPROVEMENT; DEDICATED, BY PERMISSION, TO THE RIGHT HONORABLE
AND RIGHT REVEREND THE LORD BISHOP OF LONDON, 1828."

CONSISTING OF

A CORRESPONDENCE

WITH THE

COMMITTEE

FOR

BUILDING THE NEW CHURCH AT BERMONDSEY,

ON THE SUBJECT OF

A Clock for that Church;

WITH

PRELIMINARY OBSERVATIONS, AND ADDITIONAL PAPERS.

By B. L. VULLIAMY,

CLOCK-MAKER TO THE KING, TO THE HON. BOARD OF ORDNANCE, AND TO THE NEW POST-OFFICE.

LONDON:

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1830.

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SUPPLEMENT,

§c. §c.

THE system pursued in procuring Church Clocks, particularly for the New Churches, cannot be better exemplified than by the following statement of the result of an application to me to make a Clock for a New Church.

I must premise, that in 1827 I made a very large Clock for Norwood Church; in which—availing myself of the information I had acquired when I went to Paris, the first time in 1825, to see the Public Clocks in that Capital—I made a Clock much more simple, and I believe very superior to, and entirely different from, any that had been before made.

In the spring of 1828, I was applied to by the Committee for Building the New Church, Bermondsey, through Mr. Savage, the Architect to the Church, to make a Clock for that Church, similar to the Clock I made for Norwood Church. The Chairman of the Committee, W. Nottage, Esq. accompanied by some of the Members of the Committee, personally inspected Norwood Church, St. Paul's Cathedral, and several other Clocks; and moreover, the Committee employed two eminent Engineers, Messrs. Donkin and Bramah, to survey these and other Church Clocks, and report their opinion of the same to the Committee (A). About the 18th of April, I gave Mr. Savage, for the Committee, a Specification (B) and Estimate for a Clock similar to that at Norwood Church; and I had previously furnished that Gentleman with a Plan, of what I consider to be the best mode of fixing

(A) Messrs. Donkin and Bramah's Reports, dated Feb. 9, and March 1828.

(B) Estimate and Specification, dated April 18, 1828.

a Clock and its parts in a Church-tower; and also with Drawings of the Dials made of Stone, as described at pages 7 and 8 of my Paper on Public Clocks. My plan for the Dials was adopted; whereby a saving was effected by the parish of at least 69*l*. On the 25th of April I received a Letter from Mr. Savage (c), informing me, the Committee had determined I should make the Clock, and directing my attendance, to receive the order officially. From some cause, the business was postponed to the 15th of May, when I attended (as I expected) to receive the order to make the Clock. What has since passed, I shall here relate in substance only, as it is fully detailed in the annexed Copies of the Correspondence and Papers referring to the transaction. I proceed then to state, that on being introduced to the Committee, I was informed by the Chairman, Mr. Nottage, that a Mr. Moore, a Clock-maker residing in Clerkenwell, had presented himself to the Committee, and offered to make a Clock exactly like mine at Norwood Church, for less than half the sum I had offered to make it for; and that, under these circumstances, the Committee felt obliged to employ Mr. Moore. In reply I stated, that unless Mr. Moore had already seen and taken a Plan of my Clock, it was totally out of his power to make one at all like it; and further, that in this proceeding, I conceived that Mr. Moore was actuated by the same motive that induces the proprietor of a public coach to run his coach at a positive loss, in the hopes of ruining his competitor, and thereby establishing a monopoly. In conclusion, I explicitly mentioned to the Committee, that, if Mr. Moore had not already seen the Clock, I should take the necessary steps to prevent his having access to it. I was desired to withdraw, but not to leave the house; and Mr. Moore was again called before the Committee; when, I was afterwards informed by Mr. Drew*, that the question was very closely put to Mr. Moore, Whether he could make a Clock in all respects like mine? to which he answered in the affirmative. Shortly after, Mr. Savage came to me, and told me that he was deputed by the Committee to say, that, as a Public Body, the Committee felt themselves obliged to employ the individual who would make the Clock for the lowest sum; but

(c) Mr. Savage's Letter, dated April 26, 1828.

* Vestry Clerk to the Parish of St. James, Bermondsey.

that, in return for the assistance I had afforded in arranging the Plan for the Clock in the Tower, and the Dials, the Committee had unanimously resolved to request my acceptance of the sum of twenty guineas. I begged Mr. Savage to thank the Committee for their offer, which I was very willing to accept; but upon the express understanding, that my receiving this sum was not to prejudice me from taking steps to prevent Mr. Moore from seeing the Clock at Norwood; or from noticing the transaction in such a manner as I might think proper at any future period. I was a second time called before the Committee, when I repeated what I had stated to Mr. Savage; and in addition, preferred a request to be furnished with Copies of Messrs. Donkin and Bramah's Reports upon the Comparative Qualities of my Clock at Norwood Church, as compared with the other Clocks they had examined at the request of the Committee. I was again requested to withdraw; and on being recalled, I was told, the Committee had acceded to my request. Mr. Drew, the Clerk to the Committee, further told me, that a Memorandum had been signed by Mr. Moore, to the effect, that the Clock he was going to make, should be made and fixed in a specified time; and when done, be surveyed by Messrs. Donkin and Bramah, or any other persons the Committee might think fit to appoint; and that unless they reported it equal in every respect to mine at Norwood, he was not to be paid for it. Thus ended a meeting which, at the time, caused me no small vexation.

I proceeded the same afternoon to Norwood, and saw one of the Churchwardens and the Sexton, Mr. Thorn, by whom I was informed, that Mr. Moore had sent his Foreman the *preceding Sunday morning*, before the Morning Service, to take a Plan of the Clock; who had told him, that he came, with Mr. Vulliamy's permission, to see the Clock, and that he momentarily expected Mr. Moore to join him. The Sexton, however, did not allow the man to remain in the Tower, as he wished. The next morning I saw the other Churchwarden, and requested the favour of him to give orders that Mr. Moore should be denied all access to the Clock. On my return to town, I wrote to Mr. Nottage (v), acquainting him with what I had learnt, and done.

(D) Letter to W. Nottage, Esq. dated May 16, 1828.

Being perfectly satisfied, that unless Mr. Moore, or some competent person for him, was enabled to obtain access to, and take a Plan of, my Clock, he could not make one like it;—and, consequently, of the great importance it was to him, after the very improvident engagement into which he had just entered, to acquire a sufficient knowledge of its construction, to be enabled to copy it;—the next day I wrote (e) to the Rev. A. Gibson, the Clergyman of the District, stating what had passed, and soliciting his good offices to prevent the Clock from being shewn at all, except by his order, In reply, I received a very obliging Letter (f) from that Gentleman, informing me that my request had been complied with. By this proceeding, Mr. Moore was thrown entirely upon his own resources. Some time after, Mr. Moore made a second attempt to see the Clock, but without success (g). On the 31st of July, eleven weeks after Mr. Moore had attended the Committee, I received a Note (h) from Mr. Drew, in reply to my inquiry, informing me that Mr. Moore and his Sureties had executed the Contract and Bond, in the form determined upon, as above mentioned.

Having learnt, the beginning of May 1829, that the Clock was complete and going, and moreover, that it bore very little resemblance to my Clock; and being also informed that it had been surveyed by Messrs. Donkin and Bramah, and reported inferior to mine, under the heads of Construction, Workmanship, and Material; on the 18th of the same month I wrote to Mr. Drew (i), requesting to be favoured with a Copy of this Report. I again applied to Mr. Drew on the 25th and 28th of May, for the Report. Not receiving any answer from that Gentleman, on the 10th of June I wrote to Mr. Nottage (k), requesting, as a very particular favour, to be furnished with a Copy of the Report; and stating, at length, the great importance it was to me to possess it. On the 29th of October I again

(e) Letter to the Rev. A. Gibson, dated May 17, 1828.

(f) The Rev. A. Gibson's Letter, dated May 20, 1828.

(g) Letter to Mr. Drew, dated July 5, 1828, enclosing a Copy of a Letter from Mr Edward Bramah, dated July 5, 1828.

(h) Mr. Drew's Note, dated July 31, 1828.

(i) Letter to Mr. Drew, dated May 18, 1829.

(k) Letter to Mr. Nottage, dated June 10, 1829.

wrote to Mr. Nottage to the same effect; and on the 9th of November I addressed a Letter (L) to Mr. Drew, in his capacity of Vestry Clerk, to be laid before the Committee, soliciting to be furnished with Messrs. Donkin and Bramah's third, or last Report, on the Comparative Merits of the Clock Mr. Moore had put up at Bermondsey New Church, and of my Clock at Norwood Church; or to be permitted to have the Bermondsey Clock surveyed by competent persons, for my own satisfaction. I received an answer (M) from Messrs. B. and G. Drew, dated the 12th of November, conveying a Copy of a Resolution of the Committee, refusing my request, as follows: "*That the Board consider it inexpedient to enter into a Correspondence with Mr. Vulliamy respecting the Clock, pending the incompletion of the Contract of Messrs. Moore for its erection.*"—Finding all attempts to obtain the Report from the Committee fruitless, on the 16th of November I addressed two similar Letters (N) to Mr. Donkin and to Mr. Bramah, requesting to be favoured with their Report. On the 17th I received answers from those Gentlemen (O & P), declining to give me the Report, but at the same time setting at rest, to my perfect satisfaction, the question of the Comparative Merits and Relative Value of the two Clocks.

From the above statement, which is fully borne out by the accompanying Copies of Letters and Papers, it is evident, 1st, That when Mr. Moore stated to the Committee, that he was perfectly aware how the Clock at Norwood Church was made, and that he could make one exactly like it, he asserted that which was incorrect: he had not seen the Clock, and all the information he possessed about it, was what he learnt from his man, Richard Saintsbury, who saw it once, on the Sunday morning previous to the meeting of the Committee: but it appears Mr. Moore trusted he should be able to see, and copy it. The event has proved, that, being prevented from so doing, he cannot make one like it. 2nd, That the Clock he has made is inferior to that at

(L) Letter to Mr. Drew, dated November 9, 1829.

(M) Messrs. B. and G. Drew's Letter, dated November 12, 1829.

(N) Letter to Mr. Donkin and to Mr. Bramah, dated November 16, 1829.

(O) Mr. Bramah's Answer.

(P) Mr. Donkin's Answer.

Norwood, in every respect; and that as recently as the 12th of November, the Committee considered his Contract incomplete*.

Considering the length of time (upwards of seven months) since the Clock was surveyed and reported upon, and, in addition, the circumstance of Mr. Moore having sent to Mr. Donkin to inquire in what the difference between the two Clocks consisted, that he might amend his Clock†; I think I may, without presumption, come to the conclusion, that either Mr. Moore must eventually remove his Clock from the Church, or the Parish of Bermondsey will possess a Clock very *inferior* to that which the Committee had in the first instance resolved to procure.

I will make a remark or two upon one observation in Mr. Bramah's Letter of the 17th November, viz. "That the Clock must have cost the Contractor much more than the sum you mention as the price of it;" but before I do so, I beg to say, that the precise sum for which Mr. Moore offered to make the Clock, was mentioned by Mr. Jackson‡, at the meeting on the 15th of May, 1828; who, after telling me that Mr. Moore was perfectly well acquainted with the construction of my Clock, and could make one exactly like it, repeatedly named the amount, and contrasted it with my Estimate; and, to the best of my recollection, it was 160*l.*; this, however, is the sum referred to in Mr. Bramah's Letter. I made a minute of the amount at the time, but have mislaid the memorandum; it may be a little more or less, but that is immaterial; my Estimate, in round numbers, was double that of Mr. Moore. From what I have heard of this Clock, I have good reason to believe it has cost Mr. Moore a larger sum, exclusive of the cost of fixing, than the amount he contracted for§.

This is one among many instances that I could adduce, of the modern

* See Note m.

† This Mr. Donkin told me himself.

‡ Joseph Jackson, Esq. of the Firm of Jackson and Co., Wool Staplers, 103, Bermondsey-street, residing at Blackheath, and a Magistrate for the County of Kent; the Gentleman who so strongly advocated Mr. Moore being employed to make the Clock; and who, in very unequivocal terms, told me, he considered my conduct as no more or no less than an attempt to impose upon the Committee.

§ This is also Mr. Bramah's opinion. See Note o.

practice of contracting to do work at a positive loss, to answer a particular purpose; a practice which, of late years, has prevailed to a considerable extent*. The motive is invariably an ulterior but enormous profit; either by obtaining a monopoly, or thereby to procure future orders, the profit upon which is to amply compensate for the immediate loss incurred in the competition. The result has been the ruin of individuals, and, as in the case of Mr. Moore and the Bermondsey Church Clock, has caused the practice of substituting inferior and ill-manufactured articles for others of a superior quality; which, though they be more expensive in the first instance, are, from their much greater durability, and being less expensive to keep in order, to say nothing of their superior performance, infinitely the cheapest in the end; thereby operating, in the first place, to the great prejudice of the superior manufacturer, and, in the second place, to the ultimate injury of the Public, who too frequently imagine, because an article cost little, it must necessarily be cheap; whereas the fact is directly the reverse. The best security for the faithful performance of all works of this description, of which the Public cannot be competent judges, is in the moral and professional character of the party employed; to which, in the present day, it would appear, that not much importance is attached.

I have thought it proper, in justification of my own Character, to make this transaction between the Parish of Bermondsey and myself, thus publicly known; and in consequence of the refusal of the Committee to let me have a Copy of Messrs. Donkin and Bramah's third Report, I have found it expedient to enter into a much more lengthened detail (to say nothing of the Correspondence with Messrs. Donkin and Bramah), than would otherwise have been necessary.

B. L. V.

* The Writer of this article is in possession of the facts of a case in which he was concerned, in which A, having estimated the expence of executing a piece of work (not Clock work) at a given sum, B undertook to do the same work for little more than half the sum A asked, and consequently was employed. The work being done, B applied for, and actually obtained, within a mere trifle upon the magnitude of the amount ($\frac{1}{4}$ of the amount of A's Estimate), the difference between the sum he contracted for, and A's original Estimate!!!

(A)

To the Trustees for the Building of St. James's Church, Bermondsey.

GENTLEMEN,

HAVING, in compliance with your wishes (as communicated to us by Mr. Savage), examined the new Clock at Norwood, and some other Church Clocks of the ordinary construction, for the purpose of forming an opinion of their Comparative Merits; we have given due consideration to the subject, with particular reference to those leading points specified in the Memorandum we received from the Vestry Clerk, Mr. Drew; and we have now the pleasure to communicate the result of our deliberations thereon, which is contained in the following observations:

1st.—The arrangement of the parts, and the quality of the materials of which the Norwood Clock is composed, combined with its superior workmanship, warrant the greatest durability that can be attained in machinery of that nature.

2nd.—The improved condition of the wheels and axes, afford much greater facility for cleaning and adjustment, than that usually adopted in Turret Clocks: the striking machinery being totally unconnected with the frame of the going part, is also a great improvement.

3rd.—The general construction of the working parts of the Clock, and particularly of the escapement, is very superior to any that we have seen; the Pendulum also is considerably heavier than that of the largest Church Clocks, which (in conjunction with the great accuracy of the workmanship throughout), will, in our belief, result in a much more correct measurement of time than has been heretofore observed by Clocks of the ordinary kind.

4th.—The cost of the Norwood Clock is, we find, from 350*l.* to 360*l.*; and that of a Church Clock of the common kind, 200*l.* We are of opinion, that the additional expenditure necessary to procure a Clock of the improved construction, will be a measure of ultimate economy, by the greater durability of the Clock.

5th.—We are of opinion, that a bell of 10 cwt. would be a good size for the Clock of Bermondsey New Church; and there is no doubt, that the higher the bell is placed in the steeple, the greater will be the distance at which it may be heard; and if the bell be placed above the Clock, it will simplify the connection of the striking part: the adoption of a separate bell is therefore to be preferred.

We have the Honor to be, GENTLEMEN, your obedient Servants,

(Signed)

BRYAN DONKIN,
TIMOTHY BRAMAH.

*Great Surrey-street,
9th Feb. 1828.*

Memorandum of leading Points to be attended to in the Survey of Norwood Church Clock, by Messrs. Donkin and Bramah; furnished them by Mr. Drew.

1st.—The durability of the machine.

2nd.—The facility with which it can be cleaned and kept in order; and its liability to be deranged.

3rd.—The correctness of mechanical and mathematical principles on which it is made, particularly as connected with the escapement and pendulum; the mode of communicating the motion to the hands from the Clock, and of counterbalancing the hands.

4th.—The materials of which the Clock is made, and the executing of the work.

5th.—The probability of the Clock measuring time accurately for a considerable time; and its capability, if required, to raise a hammer sufficiently heavy to strike on a very large bell.

6th.—How far the Clock is, or is not, economical, in comparison with the Clocks commonly made; taking into consideration what those Clocks cost, and what this Clock cost, particularly with reference to the durability of the Clock.

7th.—Whether it is desirable that the Clock should have a separate bell to strike on; and if so, what would be the proper weight for such separate bell, in the place suggested for the one at Bermondsey.

To Messrs. Bryan Donkin and Timothy Bramah.

To the Trustees for the Building of St. James's Church, Bermondsey.

GENTLEMEN,

AGREEABLY to your request, communicated to us by Messrs. B. and G. Drew, we have inspected the Clocks in the three several Churches of Waterloo Bridge-road, Bishopsgate-street, and another near the Old Jewry*; all of which are from the Manufactory of Messrs. Moore and Son, of Clerkenwell. Two of these Clocks certainly are very superior to those of the ordinary kind, which we examined on a former occasion, and to which we alluded in our last Report;

* If, as I suppose is the case, this is the Clock at the Church of the United Parishes of St. Olave, Jewry, and St. Martin Pomroy, it may not be irrelevant to notice, that in May 1823, I was professionally employed by Mr. Morshead of Clifford's Inn, the Vestry Clerk to those Parishes, to prepare a Plan and Specification for a Clock for that Church, to be afterwards made by any Clock-maker the Parishes chose to employ; and which Mr. Moore was employed to make from my Specification.—Mr. Moore was paid, June 1824, 218*l.* 17*s.* for the Clock, not including the Carpenter's account.

but, in our judgment, the Clock at Norwood is, for the reasons before given, incomparably the best we have examined on your account.

We have the Honor to be,

GENTLEMEN,

Your obedient Servants,

(Signed)

BRYAN DONKIN,
TIMOTHY BRAMAH.

London, March 1828.

(B)

Specification of the Clock.

The striking and going parts are entirely detached, and mounted in separate frames; and the wheels are all on the same plane, which offers great facilities for keeping in order, oiling, and cleaning the Clock: whereas, in the usual construction of Turret Clocks, the wheels of both parts are mounted in the same frame, and placed one above the other.

The escapement is what is technically termed a dead escapement, on the pin-wheel construction, with double-action self-adjusting pallets; and the pins, or teeth of the wheel, steel, each having a broad bearing on the rim of the wheel, and fastened with nuts.

The work for communicating with the four dials, is all attached to the frame of the going part; and complete in itself; there is a separate frame and set of wheels to carry each pair of hands, and a communication rod, with an adjusting lengthening socket, from the Clock to each frame. The counter weights for the hands are behind the dials, and not in front, as commonly made.

The pendulum is a two-seconds pendulum, with a heavy bob, weighing 150lbs. a little more or less, and a wood rod suspended independent of the frame of the Clock. The pendulum vibrating exactly two seconds, enables a seconds hand to be applied to the Clock, which affords a great facility for regulating the Clock in the first instance, and keeping the rate of its going afterwards.

The Clock continues going while being wound.

The striking part is made upon the principle known by the appellation of the Locking-plate construction; and is sufficiently powerful, if required, to strike on a bell of 30 cwt., and consequently to cause the time to be heard at a very consi-

derable distance. The striking-part weight is wound by means of an additional wheel and pinion, thereby avoiding that clumsy contrivance called a Jack-winder.

All the bosses or stoppings, in which are the pivot-holes, in both parts, are screwed, not rivetted, into their places, and they are all made of gun-metal. By this mode of fixing, they can easily be taken out of their places to clean out the holes, when necessary; and being gun-metal, they are very much harder and more durable than if made in the usual way of yellow brass.

The wheels of both parts, going and striking, are all made of gun-metal; and are consequently much stronger, and will last much longer, than if made of brass; probably in the ratio of three to one. They are made very thick, and thereby enabled to be cut into very high numbers; and the pinions being necessarily high numbered also, they run much smoother, and wear less, than in the case of thin wheels with coarse teeth. The two barrels, round which the cords that carry the weights wind, are made of iron: they are usually made of wood.

The two small arbours and pinions (fly and scape-wheel) are made of steel; the others of iron, case-hardened; the two large pinions in the striking part, are made of very hard gun-metal.

The above is a very correct specification of the Clock I made for Norwood Church, and is the sort of Clock I should recommend for Bermondsey New Church.

(C)

*Bermondsey Church,
April 25, 1828.*

DEAR SIR,

THE Trustees yesterday determined to accept your proposal for a Clock to strike the Hours only, and to have a Bell of 15 cwt. to strike on. The Committee meet on Monday next at eleven, when I think it would be expedient that you should attend; and I should be glad if you would then look at the Church, and see to arrange the best mode of managing the *weights*, &c.

Yours faithfully,

(Signed)

JAS. SAVAGE.

To Mr. Vulliamy, Pall-Mall.

(D)

Pall-Mall, May 16, 1828.

SIR,

I BEG to inform you, that I was at Norwood this morning, and, accompanied by Mr. Turquand, one of the Churchwardens, went to the Sexton, Mr. Thorn, who informed us, that last Sunday morning, while he was winding the Church Clock, a working-man came up into the Clock-room, who stated himself to be a workman of Mr. Moore's, Clock-maker, Clerkenwell; that he was come to examine the Clock, and that he expected Mr. Moore every minute, who was coming to take a Plan of the Clock, which would occupy some time, as he was going to make one like it. The workman expressed himself much pleased with the Clock, which he said was a very ingenious machine, and made many inquiries as to how it performed. Mr. Thorn's avocations would not allow of his waiting for Mr. Moore, and Mr. Moore did not see the Clock. If he stated to the Committee that he did, he said that (as we were informed by the Sexton) which is false; unless, indeed, he was mean enough to personify his workman.

Very peremptory orders have been given by the Churchwarden, Mr. Turquand, to the Sexton, not to shew the Clock to any person whatever; and the subject will probably be mentioned in the Vestry on Sunday next.

That Mr. Moore, to answer a particular purpose, should engage to make you a Clock precisely like mine at Norwood Church, for about half of what I had undertaken to make it for, is now easily explained. He was about, as he imagined, to profit by my labour, and the expence of my experience for many years past; for which he was to pay the difference between what the Clock would cost him making, and what he is to receive for it: and never was mechanical learning bought at a cheaper rate. Moreover, he hoped to be in a condition to be able to say, he had made a Clock on the same principle as mine, for about half the sum I charged; carefully omitting by what means he became enabled to make it at all; and as I before stated, that to answer a particular purpose, he charged a great deal less for it than it cost him making. Had Mr. Moore explained to the Committee yesterday, the means by which he meant to acquire the necessary information to enable him to make the Clock, I am persuaded he would have been treated with the contempt such conduct deserves; and the determination of the Sub-Committee, and of the Committee, that I should make the Clock for Bermondsey New Church, would not have been rescinded.

I will now take the liberty of submitting to you, as the Chairman of a Public Board, whether it is fitting that a Public Body should encourage, or sanction, a

mode of proceeding, which, in a moral view of the subject, is as iniquitous as any that can be conceived: were my Clock protected by a Patent, it would be a direct infringement of the same; and as it is, Mr. Moore is obliged to do that surreptitiously, which he would be ashamed openly to avow. When I went in 1825 to Paris, to see the Public Clocks in that Capital, I got introduced to Mr. Le Paute, the French King's Clock-maker, who made the principal Clocks at Paris. I told him for what purpose I came, and the use I should make of the information I should acquire (as stated in the printed Paper on Public Clocks, of which I had the honour to send you a copy); and he shewed me the Clocks himself. This was a very different mode of proceeding from that adopted by Mr. Moore.

I will now put the following cases:—Supposing fifty such Clocks required, for as many new Churches about to be built (which is supposing a very probable case), could Mr. Moore make them on the same terms he offers to make the Clock for Bermondsey Church? Certainly not:—and when Mr. Moore, by the line of conduct he is pursuing, has ruined all his competitors—and this is his avowed object—supposing more Public Clocks to be wanted, who is to make them, and at what price? Mr. Moore: and at whatever price he chuses to charge for them. He will have established a monopoly, which is precisely what he has been endeavouring to accomplish ever since he ceased to be a workman in the shop of the late Mr. Thwaites.

A Gentleman, a Trustee, who sat at your left hand, whose name I do not know*, who so strongly advocated Mr. Moore being employed to make the Clock, repeatedly asserted, that the Committee were, by the Act of Parliament, obliged to accept the lowest Tender. This I believe to be a mistake;—you may be obliged to advertise for Tenders, but at liberty to accept which you please. Of this I am quite certain, that at the Office of Works, Whitehall, that Tender is invariably accepted, which it is supposed offers the best security for the work being properly done, without regard to whether it is highest or lowest. The same Gentleman laid much stress on the respectability of Mr. Moore, which he stated to be equal to that of any individual practising that branch of the mechanical arts; and on the number of Clocks he had made. That Mr. Moore has made a great many Clocks, he has taken care to inform the world by printed lists, which he has circulated very widely; at the same time it is rather singular he should have profited so little by his experience, as to place himself in the situation of being obliged to copy a

* Joseph Jackson, Esq.

Clock of my making. On the subject of Mr. Moore's respectability, as a man of business, I am sure that Gentleman would not have said one syllable, had he been in possession of as much information on the means by which Mr. Moore proposed to obtain the information to enable him to make his Clock like mine, as you now possess.

I cannot conclude without thanking you, Sir, and the Gentlemen of the Committee, for the very handsome and flattering manner in which I was treated by the great majority of the Committee yesterday, and for the very liberal feeling evinced in giving me twenty guineas, as a consideration for my attendances, and the trouble I have had in advising Mr. Savage, the Architect, on various points connected with the Clock, in relation to the interior of the building; and still more, for your promise that I should be furnished by your Clerk, with a Copy of Mr. Donkin and Mr. Bramah's Reports upon the Clock I made for Norwood Church, and some other Church Clocks, including some of Mr. Moore's making; to which you added only one condition, viz. that those Gentlemen did not object to my possessing it. I have since seen Mr. Bramah, and I have the satisfaction to inform you, that so far from objecting, he strongly advises me to print the Report, and send a copy of the same to all the individuals to whom I sent copies of my Paper on Public Clocks.

I have only to add, that should Mr. Moore (finding himself frustrated in obtaining the Plan of my Clock, as he had projected), relinquish making the Clock, and you should employ me to make it, as previously determined, I will either return the twenty guineas, or consider that sum as so much received on account of the Clock.

I am, SIR,

Your much obliged and most obedient Servant,

(Signed) B. L. VULLIAMY.

*To William Nottage, Esq.
Chairman to the Committee for Building
the New Church at Bermondsey.*

P. S.—Since writing the above, I accidentally met Mr. Lincoln, the Organ-builder, who told me, that various Tenders had been made for the Organ, varying from 700*l.* to near 900*l.*; by Mr. Flight, Mr. Bishop, Mr. Gray, and himself, and that the lowest was not accepted. Now this is a most complete answer to the so often repeated assertion of the Gentleman at your left hand, that the Committee

were bound by the Act, to accept the lowest Tender. I noticed at the time, that you did not make the remark, which caused it to strike me the more forcibly; but the Gentleman before alluded to, did more than once, twice, or three times.

(E)

May 17, 1828.

SIR,

THE circumstances that have given rise to my addressing you this Letter, are sufficiently explained by the enclosed Copy of a Letter which I sent yesterday to W. Nottage, Esq. the Chairman of the Committee for Building Bermondsey Church.

I must entreat of you to take into consideration, the very unpleasant situation in which I am placed, and to afford me that relief which I think I have a right to expect at your hands. It is well known to you, and to several Gentlemen at Norwood, that the Clock I made for Norwood Church, is the result of much labour, and expence of time and money; that I went to Paris in 1825, on purpose to see the Public Clocks in that Capital; and that I made for Norwood Church, without the most distant intention of making any additional charge for the same, a much larger and more expensive Clock than I had contracted for. Under these circumstances, it is mortifying to see myself attempted to be robbed of the fruit of my labours; and I must entreat of you to give such directions as will prevent the possibility of Mr. Moore, or any other person, from seeing the Clock. Indeed I think it very probable, that an official request will be made by the Parish of Bermondsey to the Parish of Norwood, to allow the Clock to be seen; which I hope and trust will be met by a direct refusal. I entreat of you not to suppose, that I mean in the most distant manner to point out to you what is proper to be done on this occasion; but I should be very glad, if you had no objection, that the enclosed should be shewn publicly to the Vestry on Sunday; because the conduct pursued by Mr. Moore, and his abettors and supporters, serves fully to establish the estimation in which your Clock is held.

I never attempted to interfere with, or pirated Mr. Moore's work; and if he undertakes to make as good, or a better Clock than mine, let him do so from his own resources.

I am, SIR,

Your most obedient and humble Servant,

(Signed)

B. L. VULLIAMY.

To the Rev. A. Gibson.

(F)

MY DEAR SIR,

I WILL inquire whether the man you speak of has seen the Norwood Clock more than once.

We took the matter into consideration on Sunday in Vestry, and agreed unanimously, that, for the present at least, the Sexton should shew the Clock to no one without an order from the Churchwardens or myself; and I shall certainly give no order to any *Artist* for a view of it, without your approbation.

I was much concerned at the treatment you received from Mr. Moore, and the Bermondsey people. I can hardly conceive any thing more unjust on their part, or more paltry on his.

If you have not already, you will soon receive a Letter from Mr. Turquand, informing you of the Resolution we came to on Sunday.

I am, DEAR SIR, (in haste),

Yours faithfully,

(Signed)

A. GIBSON.

To Mr. Fulliamy, Pall-Mall.

Norwood, May 20, 1828.

(G)

Pall-Mall, July 5, 1828.

SIR,

I ENCLOSE you a Copy of a Note I received two days since from Mr. Edward Bramah, in reply to one I wrote him, requesting he would inquire of the Sexton at Norwood, whether any further attempts had been made by Mr. Moore to obtain a sight of my Clock.

I have since seen Mr. Bramah, and he tells me, that Mr. Moore proposed to the Sexton to let him take a Carpenter with him to the Clock, to cut out patterns of the same in wood; in short, to enable him to acquire the means of making one like it. He said he should want to remain two or three hours in the Clock-room.

Now, really, this is too bad; and I will hazard the assertion, that it is not creditable for so respectable a body of men as compose your Committee, to let themselves be made the tool of such a man as Mr. Moore. It is now a matter of notoriety at Norwood, that he cannot make the Clock, unless he can get at mine to copy it; and this he has very little chance of doing; as the Vestry have passed

a Resolution, that the Clock shall not be shewn; of which fact I was informed by Letter by the Rev. Mr. Gibson, the Clergyman of the Parish.

Some months have now elapsed since the Clock was to have been put in hand, and it is, in fact, as forward as the day I went to receive the order.

I am going to Norwood to my Friend Mr. Bramah's, in the course of a few days, to endeavour to learn all I can respecting Mr. Moore's proceedings; because it is extremely creditable to me, that he should take so much pains, and have recourse to such dirty underhand modes of proceeding, to endeavour to acquire, at my expence, information immediately connected with his profession; and as he has deprived me of making the Clock, it is but fair that I should expose his conduct in return. If I learn any thing worth your knowing, you shall hear from me.

I shall be extremely obliged to you for the Official Copy of Mr. Donkin and Mr. Bramah's Report.

I am, Sir,

Your much obliged humble Servant,

(Signed)

B. L. VULLIAMY.

B. Drew, Esq. Bermondsey.

Thursday, July 3, 1828.

DEAR SIR,

I WAS from home when yours of Monday's date arrived, or should have attended to it sooner. I saw Thorn yesterday: he tells me that Mr. Moore has made one application to gain admittance to the Norwood Clock, which he (Thorn) peremptorily refused.

He seems to be fully aware of the shabbiness of the act premeditated, and promises faithfully, that no artifice of the enemy shall induce him to shew the Clock.

I am, DEAR SIR,

Yours faithfully,

(Signed)

EDW. BRAMAH.

To Mr. B. L. Vulliamy, Pall-Mall.

(H)

MR. B. DREW'S Compliments to Mr. Vulliamy; begs to inform him, the Contract and Bond by Mr. Moore and his Sureties, have at length been executed in the form decided on when the Tenders were received.

Mr. Vulliamy, Pall-Mall.

Bermondsey, 31st July, 1828.

(I)

Pall-Mall, May 18, 1829.

SIR,

As I understand Messrs. Donkin and Bramah made their Report some time since, I take the liberty of troubling you with this Note, to request the favour of a Copy of the same, together with Copies of the same Gentlemen's former Report, or Reports, which, at my special request, Mr. Nottage publicly promised me I should have, the day I attended to receive the order for the Clock.

I am, SIR,

Your most obedient humble Servant,

(Signed) B. L. VULLIAMY.

Beriah Drew, Esq.

P. S.—You will singularly oblige me by letting me have these Reports, to which I apprehend no objection can be made, in the course of a day or two.

(K)

June 10, 1829.

SIR,

I TROUBLE you with this Letter, to request the favour of you to give instructions for my being furnished with Copies of the three Reports on Public Clocks, made by Messrs. Donkin and Bramah, in conformity with the instructions they received from Mr. Drew, which Reports you promised me, in the name of the Committee, I should have, the morning I attended at the Work-house, as directed, to receive the order to make the Clock.

The whole transaction relating to making the Clock for the New Church at Bermondsey, was, on the part of Mr. Moore, founded in falsehood and deception. Mr. Moore stated to your Committee—(so Mr. Jackson, one of the Members, told me, when I was called in, and he attached no small importance to the fact; for I pointedly asked him, as you may recollect, If it was to be like mine? and he answered, Yes),—that he (Mr. Moore) knew perfectly well how my Clock at Norwood Church was made, and, in short, all about it, and could and would make one exactly like it, for half the sum I asked. Now, in point of fact, Mr. Moore had not at that time, and never has, seen my Clock; and all he knows about it, is what his man, Mr. Saintsbury, was able to recollect from having seen it once, on the Sunday morning previous to the meeting. Mr. Moore relied upon being able to get at and copy it, to do which he made several attempts; so that he was absolutely con-

tracting to do that, which at the time he knew nothing about; and of the value of which he was consequently totally ignorant. Had Mr. Moore candidly stated to the Committee how he meant to proceed to enable him to make the Clock, as men of honour, they would have scouted the proposal: of this Mr. Moore was well aware, and therefore acted as he did.

The substance of the agreement between Mr. Moore and the Committee was, that he should, for a given sum, make a Clock similar in all respects to mine at Norwood Church, and to be certified by Messrs. Donkin and Bramah to be as good, in Principle, Execution, and Material. Now, it appears by the Report of these Gentlemen, that, under the three heads above enumerated, Mr. Moore's Clock is a total failure.

I have no doubt but that, compared with the Clocks usually made by Mr. Moore, this Clock may be termed a tolerably good one; also that it cost him a good deal more making than he agreed to make it for: the wheels were cut by Mr. Maudsley (this I learnt from Mr. Field, Mr. Maudsley's Partner), and every thing Mr. Maudsley does, is well done; but as a whole, it is very inferior indeed to my Clock. I beg further to add, that I am perfectly aware Mr. Moore assigns as a reason for the inferiority of his Clock, his inability to see mine; but this is nothing to the purpose: he began by asserting that he knew how mine was made, and could make one in all respects like it. His failure, is the best practical proof that he asserted that which was not correct.

If Mr. Moore's conduct affected me merely in a pecuniary manner, I should care little about it; and the transaction, and all that gave rise to it, would long since have ceased to occupy my attention; but, unfortunately, my Character is seriously impugned, and on this account I have taken the liberty to trouble you. The story, as told by Mr. Moore and his Friends, is very simple, and very plausible, viz. that I, the King's Clock-maker, was applied to, to make a Clock at a fixed price for Bermondsey New Church, similar to one I had made for Norwood Church; and that I attended the Committee to receive the order to make it; but that he, Mr. Moore, having heard of the same, attended also, and undertook to make a similar Clock for half the price I asked, and subject to his Clock being surveyed and reported upon by Messrs. Donkin and Bramah; its being kept, depending upon that Report; that he made the Clock, and put it up, and that it was so surveyed.

That those Gentlemen reported favourably, is to be inferred as a necessary consequence, from the circumstance of the Clock remaining in its place (it is now three months since, passing the Church, I saw by the hands, that the Clock was

up, and going); for it cannot be expected that Mr. Moore and his supporters should state the contrary to be the case, and make the Report public.

Now, my answer to this statement is best made by producing a Copy of Messrs. Donkin and Bramah's Reports.

I am, SIR,

Your much obliged and most obedient Servant,

(Signed)

B. L. VULLIAMY.

To W. Nottage, Esq.

Chairman to the Committee for Building

Bermondsey New Church.

(L)

Pall-Mall, Nov. 9, 1829.

SIR,

I HAVE written several Letters to yourself, as Clerk to the Bermondsey New Church Committee, and to Mr. Nottage, as Chairman, without having received any answer, requesting to be furnished with a Copy of Messrs. Donkin and Bramah's Reports on Turret Clocks, particularly on the Clock Mr. Moore made for Bermondsey New Church, and the Clock I made for Norwood Church; to which, under all the circumstances of the case, I consider myself entitled.

I understand a meeting of the Church Committee will be held on Thursday, which I would attend, were I not obliged to be at Windsor, to complete a new Clock I am putting up at the Castle; I must therefore content myself with begging you will do me the favour to prefer my request to the Committee, to be furnished with the Copies of these Reports: or if the Committee refuse to let me have them, that I may be permitted to have the Bermondsey Clock surveyed by such competent persons as I may think fit, with a view to having the Norwood Clock surveyed by the same parties, and obtaining their Report upon the Comparative Merit of the two Clocks.

I consider it due to my Character, not to subject myself to lie under the imputation of having asked 300*l.* to do that which another individual offered to do, and asserts he has done, equally well, for 160*l.* I think 300*l.* and 160*l.* were the sums, but that is immaterial; the difference was very great.

At present, the case stands thus: Mr. Moore and his Friends say, "That " Mr. Vulliamy asked 300*l.* for a Clock similar to one he had made for Norwood

" New Church; that Mr. Moore undertook to make one exactly like it for 160*l.*, " and subject to his Clock being surveyed by Messrs. Donkin and Bramah, who " had previously examined the Clock at Norwood Church; or any other persons " the Committee might think fit to employ for that purpose; and his being paid " for his Clock, to depend upon their reporting it to be in all respects equal to the " Clock made by Mr. Vulliamy. The Clock is made, and put up, and has been " surveyed by Messrs. Donkin and Bramah."

Of course Mr. Moore and his Friends are silent upon the conclusion of the business, which is, that Messrs. Donkin and Bramah having surveyed his Clock, reported it inferior to mine in three most material points; viz. Construction, Workmanship, and Material; and that he sent to Mr. Donkin to request to be informed in what the difference between the two Clocks consisted, that he might amend his; and that in consequence of the Report, he is not paid for his Clock.

I am aware that Mr. Moore's Friends in the Committee state, as a reason for Mr. Moore's Clock being inferior to mine, that I prevented him from seeing my Clock. To this I beg to reply, that Mr. Nottage put the question pointedly to Mr. Moore, the first time he attended the Committee, Whether or not he was acquainted with the construction of my Clock, and could make one similar in every respect? His reply was, That he was perfectly aware of the construction, and of every thing relating to my Clock, and could and would make one exactly like it. This was repeated to me by Mr. Jackson, in reply to my observation, That Mr. Moore could not make such a Clock at all. Mr. Jackson then added, That if Mr. Moore could make the Clock for 160*l.*, I could; accompanied by some observations not particularly civil, and which, as the thing has turned out, had better not have been said. This was the first time I was called before the Committee.

I do not deny that I prevented Mr. Moore from seeing the Clock; but I assert, he had no right to profit, as he intended doing, by my labour and experience, and the great expence I had been at to acquire the knowledge I possess. I went direct from the Committee to Norwood, saw the Sexton the same evening, and the Churchwardens the next morning; and the following Sunday, such was the opinion the Norwood Vestry entertained of the whole proceeding, that, upon the recommendation of the Rev. Mr. Gibson, it was unanimously resolved, that the Clock should not be shewn at all.

Mr. Moore, to carry his point, having recourse to a direct falsehood, must submit to the inconvenience that sooner or later results from such a line of conduct. He had sent his man, Mr. Saintsbury, the preceding Sunday morning early, to Norwood Church, who, finding the door open, walked up into the Tower,

and told the Sexton, who was engaged winding the Clock, that he was come to take a Plan of it; that he should require to remain some time in the Tower; adding, that he expected Mr. Moore to join him immediately. The Sexton, not feeling justified in leaving a stranger in the Tower, insisted upon his leaving it. Now, all Mr. Moore knows of this Clock, he learnt from his man, Saintsbury. A few days after he received the order to make the Clock, he again sent his man, and a Carpenter, with the necessary materials to make Models and Patterns of the Clock, and take the dimensions of its parts. They were unable to obtain access to the Clock, and he consequently finds himself in the dilemma in which he is now placed.

I am sorry to trouble you with so long a Letter, but I think it absolutely necessary the Committee should be fully apprised of all that has occurred.

I am, Sir,

Your most obedient Servant,

(Signed) B. L. VULLIAMY.

*To Beriah Drew, Esq.
Vestry-Clerk, Bermondsey,
&c. &c. &c.*

(M)

Bermondsey, Nov. 12, 1820.

SIR,

Was submitted to the Trustees of Saint James's Church, at their meeting of this day, your Letter of the 9th inst.; and the Board came to a Resolution thereon, as under:

"That this Board consider it inexpedient to enter into a Correspondence with Mr. Vulliamy respecting the Clock, pending the incompleteness of the Contract of Messrs. Moore for its execution."

We are, Sir,

Your obedient Servants,

B. & G. DREW,
Clerks.

To Mr. Vulliamy, Pall-Mall.

(N)

Pall-Mall, Nov. 16, 1820.

DEAR SIR,

As the course of proceeding the least liable to mistake or misconstruction, as to the motives which influence me, in addressing you on the

present occasion, I enclose you a Copy of a Letter, dated the 9th inst. which I forwarded to Mr. Drew, Clerk to the Vestry of St. James, Bermondsey, and of his Answer, dated the 12th, in which you will find my request has been refused in the most offensive manner, inasmuch as more than sufficient time has elapsed, to shew that Mr. Moore cannot complete, or rather improve, his Clock, but by surreptitiously obtaining access to that which I made for the Church at Norwood. The "incompletion of the Contract" for the Bermondsey Church Clock, must therefore continue until he can accomplish that object; and, as a natural consequence, I am deprived, during that period, of obtaining that information which alone can afford me the means of replying to those aspersions which I find are industriously circulated, to the prejudice of my character as a Clock-maker.

My only resource is, to request of you to furnish me with a Copy of the Report made by Mr. Donkin and yourself, as to the merits of Mr. Moore's Clock at Bermondsey, compared with my Clock at Norwood. That Report will, I apprehend, be the most satisfactory answer to the attempts that have been made to prejudice my interests as a Manufacturer. Should any difficulty exist to your complying with my request, I hope you will not object to giving me such information as may enable me, in some degree, to counteract the effects of the reports I have alluded to.

I deem it right to say, that I am not actuated by any pecuniary motive, so far as relates to the Bermondsey Church Committee; for I have not the most distant idea that the Committee will ever again apply to me on the subject. At the same time, it is essential that I should make this transaction public; because I never can expect to be employed to make a Public Clock, so long as the means are withheld from me of contradicting the report of Mr. Moore and his Friends, that he, subject to certain very binding conditions and penalties (drawn up by the Vestry Clerk, Mr. Drew), made a Clock in all respects the same as that at Norwood, for less than half the sum I asked; and that Mr. Donkin and yourself have certified that he has accomplished what he undertook to do.

I am, DEAR SIR,

Your most faithful Servant,

B. L. VULLIAMY.

To Mr. Bramah.

P. S.—I have sent a similar Letter and Enclosures to Mr. Donkin.

(O)

Pimlico, 17th Nov. 1820.

DEAR SIR,

I HAVE to acknowledge your Letter of the 16th inst. enclosing a Copy of Correspondence with the Vestry Clerk of St. James, Bermondsey, and requesting to be furnished with the Report made by Mr. Donkin and myself to the Trustees for Building that Church, on the subject of the Clock.

I cannot consistently comply with your request, by giving you the Report; but while you are subjected to the influence of such injurious assertions as those you have represented, and at the same time you are not permitted (for the present at least), the opportunity of obtaining the means of their refutation, I do feel disposed, in a case of such unparalleled hardship, to deviate from the course which I should pursue under other circumstances, by informing you, that the Clock in question is not made in any respect equal, but very inferior to that at Norwood Church. I am also of opinion, that it must have cost the Contractor much more than the sum you mention as the price of it.

The inconvenience that must necessarily be experienced by all the parties in this transaction, is amongst the numerous instances that occur, of the evil consequences of unreservedly accepting the lowest price that may be tendered for the performance of a Contract, which, although it be not confined to the Art of Clock-making, surely ought not to prevail in matters of mechanical science.

I remain, DEAR SIR,

Yours faithfully,

(Signed)

TIMOTHY BRAMAH.

To Mr. B. L. Vultiamy, Pall-Mall.

(P)

6, Paragon, New Kent Road, 17th Nov. 1829.

DEAR SIR,

I RECEIVED your Letter this evening, together with a Copy of your Letter of the 7th of November last, to the Trustees of Bermondsey New Church (St. James's), relative to the Clock erected there by Messrs. Moore and Son, Clerkenwell; also a Copy of a Letter from Messrs. B. and G. Drew, Clerks to the Trustees, containing a Copy of the Resolution come to at a Meeting of the Trustees, in answer to your Letter.

I have always considered that a Report made by a professional man, becomes exclusively the property of those to and for whom it was made. Upon this general principle, I was restrained from complying with your request, "to give you a Copy of the Report made by Mr. Bramah and myself to the Trustees of St. James's Church, Bermondsey, on the Clock put up in that Church by Messrs. Moore and Son;" and I have now the additional reason, namely, that the Trustees have themselves refused it.

I can take upon myself to say for Mr. Bramah as well as myself, there is not only no disinclination on our parts to give you a Copy of the Report, were we at liberty to do so; but that it would give us both much pleasure, if it could be made the instrument of contradiction to the false reports you complain of.

Since you have received a Copy of the Resolution of the Trustees, in which it is stated, that the Contract entered into by Messrs. Moore and Son is not yet completed, it appears to me, that it is almost tantamount to your having the Report itself.

I am, DEAR SIR,

Yours very truly,

(Signed)

BRYAN DONKIN.

To Mr. B. L. Vulliamy, Pall-Mall.

ADDITIONAL PAPERS.

The following very flattering Testimonial respecting a Clock I made for Lowther Castle, was offered me six years ago, perfectly unsolicited on my part. The Clock has since been purchased by the Lords of the Treasury, and put up at the New Post-Office.*

London, 14th April, 1823.

SIR,

WE have much pleasure in offering you our united Testimonial of the great superiority of the large Turret Clock which you have submitted to our examination, and which you informed us, was originally made for the Earl of Lonsdale's Seat in Westmoreland. We consider the principle of its construction, and the arrangement you have made for supporting a much heavier Pendulum than has been heretofore used, very ingenious, and highly creditable to your professional ability; and the accuracy of the workmanship throughout, is such as (we believe) has not been equalled in any Clock of similar magnitude. From these essential advantages, we have no doubt you will obtain a precision in the division of time, and a durability of action, which will fully compensate the labour and attention you have bestowed upon this beautiful specimen of mechanical contrivance and execution.

We remain, SIR, your obedient Servants,

M. C. BRUNELL, F. R. S.
BRYAN DONKIN,
JOSHUA FIELD,
TIMOTHY BRAMAH,
THOMAS HOBLYN,
JOHN POND†,
WILLIAM CONGREVE‡.

*To B. L. Vulliamy,
Clock-maker to the King, Pall-Mall.*

* At some future period I may possibly publish a description of the mode by which I was enabled to suspend, without inconvenience, the Pendulum of this Clock, the bob of which weighs 448 lbs.

† Astronomer Royal.

‡ Major-General, and Comptroller of the Royal Laboratory, and Superintendent of the Royal Military Repository, Woolwich.

Colonel Jones, Commanding Royal Engineer at Woolwich, having, by the direction of the Honorable Board of Ordnance, surveyed, in the Autumn of 1828, the Clock I made for Norwood Church, and made a Report thereon; I applied to the Board, to be so good as to let me have a Copy of the same; and the Board very obligingly acceded to my request. I am thereby enabled to make public a Report, which, considering by whom it is made, is deserving of much attention.

*Office of Ordnance,
6th Oct. 1828.*

SIR,

IN reply to your Letter of the 4th inst. I am directed by the Board, to transmit to you an Extract from the Report made by Col. Jones, Commanding Royal Engineer at Woolwich, respecting the Clock made by you for Norwood Church.

I am, SIR,

Your obedient Servant,

(Signed) R. BYHAM.

To Mr. Vulliamy, Pall-Mall.

Extract from a Letter dated the 4th August, 1828, from Colonel Jones, the Commanding Royal Engineer at Woolwich, to the Secretary to the Honorable Board of Ordnance, reporting on a Clock fixed up in Norwood Church by Mr. Vulliamy.

IN obedience to your Letter of the 28th July, I have been to Norwood, and having minutely inspected in detail the Works, &c. of the Clock made and fixed up in the Church at that place by Mr. Vulliamy, I beg leave to report, that it appears to me superior to any Turret Clock I have seen, in the following points:

1st, In Simplicity of Construction;—there being fewer wheels and pinions both in the going and striking parts, than in an ordinary Clock; and those two movements being perfectly distinct, and only acting together through the medium of the discharging piece, any accident to the one may

be repaired without deranging the other ; indeed, this latter advantage may be said to extend through every detail of the machinery ; for the holes of the pivots in which the wheels work, being fixed by screws, the simple removal of the bosses enables a single wheel or piece to be taken out, and repaired or cleaned, without taking to pieces the remainder of the works. This construction also gives great facility for keeping the machinery oiled.

2nd, In Durability.—The wheels and pinions are made of hard gun-metal and steel ; which latter, besides being of longer duration, have the advantage over the usual iron case-hardened pinions, of wearing equally, and not into angular points, which is found to destroy the wheels most rapidly. This substitution of hard gun-metal and steel for yellow brass and case-hardened iron, appeared to be general throughout the acting parts of the machine, giving more strength to each.

3rd, In Regularity of keeping Time.—The escapement is a dead escapement, which has the least possible loss of power from drop, and is so well contrived, that it instantly caught my attention. In this Clock it maintains in motion a Pendulum weighing 150 lbs., which, being far heavier than the Pendulum of an ordinary Clock of the same size, cannot fail to make it go more accurately.

The barrel cylinders, round which the lines of the weights are coiled, are of iron.

The workmanship of every part is of excellent quality, and very far superior to that of the Clocks at Woolwich*.

Conclusion.—From the above it seems almost certain, that a Clock of this construction, besides shewing time more accurately, must last much longer, and be more rarely out of repair, than an ordinary Clock ; and further, from its simplicity, it may be looked after, and kept in order, by a very moderate mechanic.

* These Clocks were made by the late Mr. Thwaites, of Rosamond-street, Clerkenwell.

The following information has been transmitted to me from an authentic source :

“ Mr. Moore having entirely failed in completing his Clock for the New Church, St. James's, Bermondsey, according to the terms of his engagement with the Trustees, was directed, the latter end of February, to take it down, and remove it from the Church.”

This simple fact is a corollary the most to the purpose, that could possibly be added to the foregoing statement.

B. L. V.

London,
March 1, 1830.

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